Technische Berichte

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Titel des Berichts:
Automatic Security Checks on the Model Level

Abstract:
The working package AP 5.1.3 deals with descriptions of security requirements on the modeling level of UML statecharts as well as with automatic checking of UML statecharts against such descriptions. We use textual annotations to introduce information-flow constraints in UML statecharts. The constraints concern mainly authentication, declassification, and sanitization errors. The annotations are automatically loaded by information-flow checkers that check whether the imposed constraints hold or not. For the purpose of checking, the UML statecharts are transformed into C source code, and errors traces are presented as UML sequence diagrams. Together with the checkers, we developed an annotation language editor, a UML statechart editor and a source code generator. All the implementation uses Eclipse Modeling Framework. The experimental results show that this approach is effective and could potentially be further applied to other types of UML models and to programming languages other than C in order to detect different types of vulnerabilities. Our results use and build upon SiBASE working packages 5.1.2, 5.1.4 and 5.2.1.

Jahr:
2016

Sprache:
en

Occurences:
· Einrichtungen > Fakultäten > Fakultät für Informatik > Technische Berichte > 2016

entries: